

**Phase 1 Archaeological/Heritage Impact Assessment for
Prospecting Rights to prospect for Diamonds (Alluvial and
Kimberlite) in respect of Remainder of Kalkfontein A 13 Farm,
situated within Boshof Local Municipality, Free State
Province**

Report prepared for.

Ankone Consulting (Pty) Ltd

PostNet Suite 435, Private Bag X 4, Wierda Park, 0149

Email: thendon@ankoneconsulting.co.za / info@ankoneconsulting.co.za

Cell: 083 295 4315/076 222 3586

Author: Mlilo Trust (Professional Archaeologist and Heritage Management Specialist (ASAPA member))

Executive Summary

Item	Description
Proposed development and location	Prospecting for Diamonds (Alluvial and Kimberlite) in respect of Remainder of Kalkfontein A 13 Farm, situated within Boshof, Local Municipality Free State Province
Purpose of the study	Archaeological Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed project on these resources within the area demarcated for the prospecting application.
1:50 000 Topographic Map	2725 CC
Coordinates	S27° 51' 30.02", E025° 15' 44.55"
Municipalities	Boshof Local Municipality, Lejweleputswa District Municipality
Predominant land use of surrounding area	Agriculture, tourism and small scale mining
Developer	DMR Reference No: FS 30/5/1/1/2/10467 PR
Contact Person	Thembile Nzuzza
Contact Details	Cell: 082 538 0734/076 222 3586 Email:thembilen@ankoneconsulting.co.za / info@ankoneconsulting.co.za
Heritage Consultant	<i>Integrated Specialist Services (Pty) Ltd</i>
Contact Person	Trust Mlilo 135 Pitzer Road Glen Austin, Midrand 1685 Tel: 011 037 1565 Cell: 071 685 9247 Email:trust@issolutions.co.za
Report Date	09 November 2017

DECLARATION

Ability to conduct the project

Trust Mlilo (MA, BA Hons, PDGE, BA (Archaeology)) is a professional archaeologist and heritage specialist. He is a member of the Association for Southern African Professional Archaeologists (ASAPA), and accredited by Amafa akwaZulu Natali and Eastern Cape Heritage Resources Agency (ECPHRA). Mlilo has more than 15 years of experience in heritage management in Southern Africa. He has done more than hundred Phase 1 and Phase 2 AIA/HIA Studies for private and public sector though out the 9 provinces of South Africa. He has done Phase 1 and Phase 2 as well as heritage nomination work for government departments and municipalities such as Nkangala District Municipality, parastatals (Eskom) and several private companies such as BHP Billiton, Rhino Minerals and Gibb. The work done include AIA/HIA for linear developments such as powerlines, roads, substations, mining right and prospecting right application and other infrastructure developments. Mlilo has also conducted several Phase 2 HIA projects that include grave relocations and application for destruction permits. Mlilo has done management plans for several high profile heritage sites such as the Oliver Tambo Precinct and Chris Hani Burial site just to name a few. Mlilo has participated in several heritage management workshops run by SAHRA and PHRAs. His detailed CV is available on request.

Copy Right

Authorship: This AIA/HIA Report has been prepared by Mr Trust Mlilo (Professional Archaeologist). The report is for the review of the Heritage Resources Agency (PHRA).

Copyright: This report and the information it contains is subject to copyright and may not be copied in whole or part without written consent of Ankone Consulting (Pty) Ltd and Integrated Specialist Services (Pty) Ltd. The report can be reproduced by the Ankone Consulting (Pty) Ltd and The South African Heritage Resources Agency since it is required for the purposes of the Archaeological and Heritage Management purposes in accordance with the National Heritage Resources Act, Act 25 of 1999

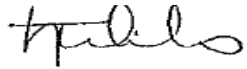
Geographic Co-ordinate Information: Geographic co-ordinates in this report were obtained using a hand-held Garmin GPS. The manufacturer states that these devices are accurate to within +/- 5 m.

Maps: Maps included in this report use data extracted from the NTS Map and Google Earth Pro.

Disclaimer: The Authors are not responsible for omissions and inconsistencies that may result from information not available at the time this report was prepared.

The Archaeological and Heritage Impact Assessment Study was carried out within the context of tangible and intangible cultural heritage resources as defined by the SAHRA Regulations and Guidelines as to the authorisation for the proposed prospecting.

Signed by

A handwritten signature in black ink, appearing to be 'H. P. ...'.

March 2018

ACKNOWLEDGEMENTS

The authors acknowledge Ankone (Pty) Ltd for their assistance with project information, and the associated project BID as well as responding to technical queries related to the project.

Ankone Consulting (Pty) Ltd requested ISS to conduct an AIA study for the proposed Prospecting Right application on the Remainder of Kalkfontein A 13 in the Boshof Local Municipality of the Free State Province. For compliance purposes, a predevelopment Heritage Impact Assessment is required. This document is a Phase 1 AIA that serves to inform and guide the developer and contractors about the possible impacts that the development (prospecting for diamond) and its ancillary activities (such as road, dumps etc) may have on heritage resources (if any) located in the study area. The document must also inform South African heritage authorities about the presence, absence and significance of heritage resources that are located and or are likely to occur in the study area. The identification, recording, reporting and salvaging (if necessary) of significant heritage resources that may occur on the development footprint should be undertaken by a competent heritage practitioner as required by South Africa heritage laws. In compliance with these laws Ankone Consulting (Pty) Ltd contracted ISS to carry out an Archaeological Impact Assessment of the proposed prospecting rights application on a piece of land located on the Remainder of Kalkfontein A 13 in the Boshof Local Municipality of the Free State Province. The study which involves a literature and database search of known/published material about the area of study that can shed light on the presence or the likelihood of heritage resources on and around the development footprint. However, it should be noted that the area is not on pristine ground, having been previously farmed as can be seen on historical Google Earth imagery. The apparent lack of significant heritage landmarks relating to the area may well be an indication of the research bias because approximately 6km to the southeast lies the Rock engraving site where a few archaeological sites were reported (Pelser 2009, van Schalkwyk, 2017).

Nonetheless no archaeological resources were identified in the published literature and databases relating to the area under study. It should be noted that the potential for occurrence of subsurface lithic scatters, unmarked graves, Iron Age and historical resources, still remain. When these resources (including graves) are encountered, work must be stopped forth-with and the finds must be reported to the South African Heritage Resource Agency (SAHRA). However, in terms of the archaeology study of the area under investigation, this Phase 1 study involving surface surveys seeks to identify archaeological remains that are usually localised and may not be easily identified from historical images and studies conducted elsewhere. This report must also be submitted to the SAHRA or the relevant PHRA for review.

Based on the basic literature assessment of South African archaeology the probability of archaeological and cultural heritage sites within the proposed development can be summarised as follows:

1. Early Hominin: Probability – *None*

2. Stone Age

a. Probability ESA: – *Low*

b. MSA: Probability – *Low*

c. LSA: Probability – *Low*

i. Rock Art: Probability – *None-Low-medium*

ii. Shell Middens: Probability – *None*

3. Iron Age

a. Early Iron Age: Probability – *None*

b. Middle Iron Age: Probability – *None*

c. Later Iron Age: Probability – *Medium*

4. Colonial Period

a. Colonial Period: Probability – *None-Low-medium*

b. Iron Age / Colonial Period Contact: Probability – *medium to high*

TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
DECLARATION	3
COPY RIGHT	3
ACKNOWLEDGEMENTS	4
ABBREVIATIONS	9
DOCUMENT INFORMATION	11
PERIODISATION	11
3.2 DEFINITIONS	11
3.3 ASSUMPTIONS AND DISCLAIMER.....	13
TERMS OF REFERENCE (TOR).....	14
INTRODUCTION.....	14
PROJECT DESCRIPTION.....	19
LEGISLATION CONTEXT	19
METHODOLOGY.....	23
ASSUMPTIONS AND LIMITATIONS	28
RESULTS: THE ARCHAEOLOGY OF THE PROJECT AREA.....	29
IRON AGE ARCHAEOLOGY	31
HISTORICAL AND MINING HERITAGE (~ AD 1800 TO 1950)	32
9.4 INTANGIBLE HERITAGE.....	34
PHOTOGRAPHIC PRESENTATION OF THE PROJECT SITE.....	35
SUMMARY OF FINDINGS	38
DISCUSSION.....	40
CHANCE FINDINGS PROCEDURES	41
RECOMMENDATIONS.....	41

CONCLUDING REMARKS.....	43
REFERENCES	44

LIST OF FIGURES

Figure 1: Location of the study area	16
Figure 2: Location of the study area	17
Figure 3: Map of the Vaal River dating prior to 1935 (Van Schalkwyk, J. 2017).....	18
Figure 4: View of sign post showing direction to the Rock Engraving site (Author 2017)	30
Figure 5: A historical image of 19 th century gold mining activities near Rooderand Goldfieds in Venterskroon (Pelser 2009: 176).....	34
Figure 6: A road that cuts across the proposed mining site (Author 2017).	35
Figure 7: General view of project site (Author 2017).....	36
Figure 8: General view of project sit (Author 2017).	36
Figure 9: View of farm house taken from the road (Author 2017).....	37
Figure 10: View of project site (Author 2017).....	37

ABBREVIATIONS

AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
EIA	Environmental Impact Assessment
EIA	Early Iron Age (<i>EIA refers to both Environmental Impact Assessment and the Early Iron Age but in both cases the acronym is internationally accepted. This means that it must be read and interpreted within the context in which it is used.</i>)
EIAR	Environmental Impact Assessment Report
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
ICOMOS	International Council of Monuments and Sites
LIA	Late Iron Age
LFC	Late Farming Community
LSA	Late Stone Age
MAA	Mineral Amendment Act, No 103 of 1993
MIA	Middle Iron Age
MPRD	Mineral and Petroleum Resources Development Act 28 of 2002
MSA	Middle Stone Age
NEMA	National Environmental Management Act 107 of 1998
NHRA	National Heritage Resources Act 25 of 1999

PHAR	Provincial Heritage Resource Agency
SAHRA	South African Heritage Resources Agency
ToR	Terms of Reference

DOCUMENT INFORMATION

Periodisation

Archaeologists divide the different cultural epochs according to the dominant material finds for the different time periods. This periodization is usually region-specific, such that the same label can have different dates for different areas. This makes it important to clarify and declare the periodization of the area one is studying. These periods are nothing a little more than convenient time brackets because their terminal and commencement are not absolute and there are several instances of overlap. In the present study, relevant archaeological periods are given below;

Early Hominin (going back some 6-8million year ago)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

Early Iron Age (~ AD 200 to 1000)

Late Iron Age (~ AD1100-1840)

Historic (~ AD 1840 to 1950, but a Historic building is classified as over 60 years old)

3.2 Definitions

Just like periodisation, it is also critical to define key terms employed in this study. Most of these terms derive from South African heritage legislation and its ancillary laws, as well as international regulations and norms of best-practice. The following aspects have a direct bearing on the investigation and the resulting report:

Cultural (heritage) resources are all non-physical and physical human-made occurrences, and natural features that are associated with human activity. These can be singular or in groups and include significant sites, structures, features, ecofacts and artefacts of importance associated with the history, architecture or archaeology of human development.

Cultural significance is determined means of aesthetic, historic, scientific, social or spiritual values for past, present or future generations.

Value is related to concepts such as worth, merit, attraction or appeal, concepts that are associated with the (current) usefulness and condition of a place or an object. Although significance and value are not mutually exclusive, in some cases the place may have a high level of significance but a lower level of value. Often, the evaluation of any feature is based on a combination or balance between the two.

Isolated finds are occurrences of artefacts or other remains that are not in-situ or are located apart from archaeological sites. Although these are noted and recorded, but do not usually constitute the core of an impact assessment, unless if they have intrinsic cultural significance and value.

In-situ refers to material culture and surrounding deposits in their original location and context, for example an archaeological site that has not been disturbed by farming.

Archaeological site/materials are remains or traces of human activity that are in a state of disuse and are in, or on, land and which are older than 100 years, including artifacts, human and hominid remains, and artificial features and structures. According to the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), no archaeological artefact, assemblage or settlement (site) and no historical building or structure older than 60 years may be altered, moved or destroyed without the necessary authorization from the South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority.

Historic material are remains resulting from human activities, which are younger than 100 years, but no longer in use, including artefacts, human remains and artificial features and structures.

Chance finds means archaeological artefacts, features, structures or historical remains accidentally found during development

A *grave* is a place of interment (variably referred to as burial) and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place. A grave may occur in isolation or in association with others where upon it is referred to as being situated in a cemetery (contemporary) or burial ground (historic).

A *site* is a distinct spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

Heritage Impact Assessment (HIA) refers to the process of identifying, predicting and assessing the potential positive and negative cultural, social, economic and biophysical impacts of any proposed project which requires authorization of permission by law and which may significantly affect the cultural and natural heritage resources. Accordingly, a HIA must include recommendations for appropriate mitigation measures for minimizing or circumventing negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Impact is the positive or negative effects on human well-being and / or on the environment.

Mitigation is the implementation of practical measures to reduce and circumvent adverse impacts or enhance beneficial impacts of an action.

Mining heritage sites refer to old, abandoned mining activities, underground or on the surface, which may date from the prehistorical, historical or the relatively recent past.

Study area or 'project area' refers to the area where the developer wants to focus its development activities (refer to plan).

Phase I studies refer to surveys using various sources of data and limited field walking in order to establish the presence of all possible types of heritage resources in any given area.

3.3 Assumptions and disclaimer

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be remembered that archaeological deposits (including graves and traces of mining heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed at the site during mining, such activities should be halted immediately, and a competent heritage practitioner, SAHRA or PHRA must be notified in order for an investigation and evaluation of the find(s) to take place (cf. NHRA (Act No. 25 of 1999), Section 36 (6)). Access to the entire development site was restricted by the landowners, as such the survey was based on sites accessible through public roads and state land. In addition, layout map of the proposed prospecting rights application was not available at the time of the survey. Recommendations contained in this document do not exempt the developer from complying with any national, provincial and municipal legislation or other regulatory requirements, including any protection or management or general provision in

terms of the NHRA. The author assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

Terms of Reference (ToR)

Ankone Consulting (Pty) Ltd commissioned ISS to carry out an AIA study of the proposed prospecting rights application for mining diamonds on the farm gold prospecting rights application Remainder of Kalkfontein A 13 in the Boshof Local Municipality of the Free State Province.

The author was requested by Ankone Consulting (Pty) Ltd to conduct an AIA study addressing the following issues:

- Archaeological and heritage potential of the proposed mining development including any known data on affected areas;
- Provide details on methods of study; potential and recommendations to guide the SAHRA to make an informed decision with regards to authorization of the proposed prospecting right application.

This study will include the following tasks:

- Identify and map (through literature review and field work) all archaeological, cultural and heritage resources in the proposed project area
- Assess the significance of the identified resources
- Assess the impact of the proposed project on the heritage resources.

Introduction

Ankone Consulting (Pty) Ltd requested ISS to conduct an AIA study for proposed prospecting rights application on the farm Kalkfontein A 13 within Boshof Local Municipality of the Free State Province. The study area is situated on the edge of the Free State provincial border with the North Wests, immediately south of the Vaal River in an area approximately 9km from Christiana. As prescribed by SAHRA and stipulated by various legislations, an AIA is a pre-requisite for this kind of development. The overall purpose of this heritage report is to identify, assess any heritage resources that may be located in the study area and evaluate the positive and negative impacts of the proposed development on these resources in order to make recommendations for their appropriate management. This study involved background research of published literature, maps and databases (desktop studies), with limited field surveys due to lack of access in private properties. The study intimated that a very low probability of encountering undisturbed surface finds but

digging would likely result in disturbance to probable Stone Age, Iron Age and historical sites. This disturbance may be minimised by carrying out walk down survey once the prospecting points are identified. Isolated finds can be identified during this stage but may still lie buried in the ground until they are encountered as chance finds during prospecting. Because of the destructive nature of diamond mining, a walk down survey may be needed before prospecting commences but the archaeology of the area suggests a low probability of encountering landmarks within their pristine contexts. Should prospecting work be allowed to continue, full cognisance of clear procedures to follow in the event of chance findings must be adhered to by the developer and their contractors.

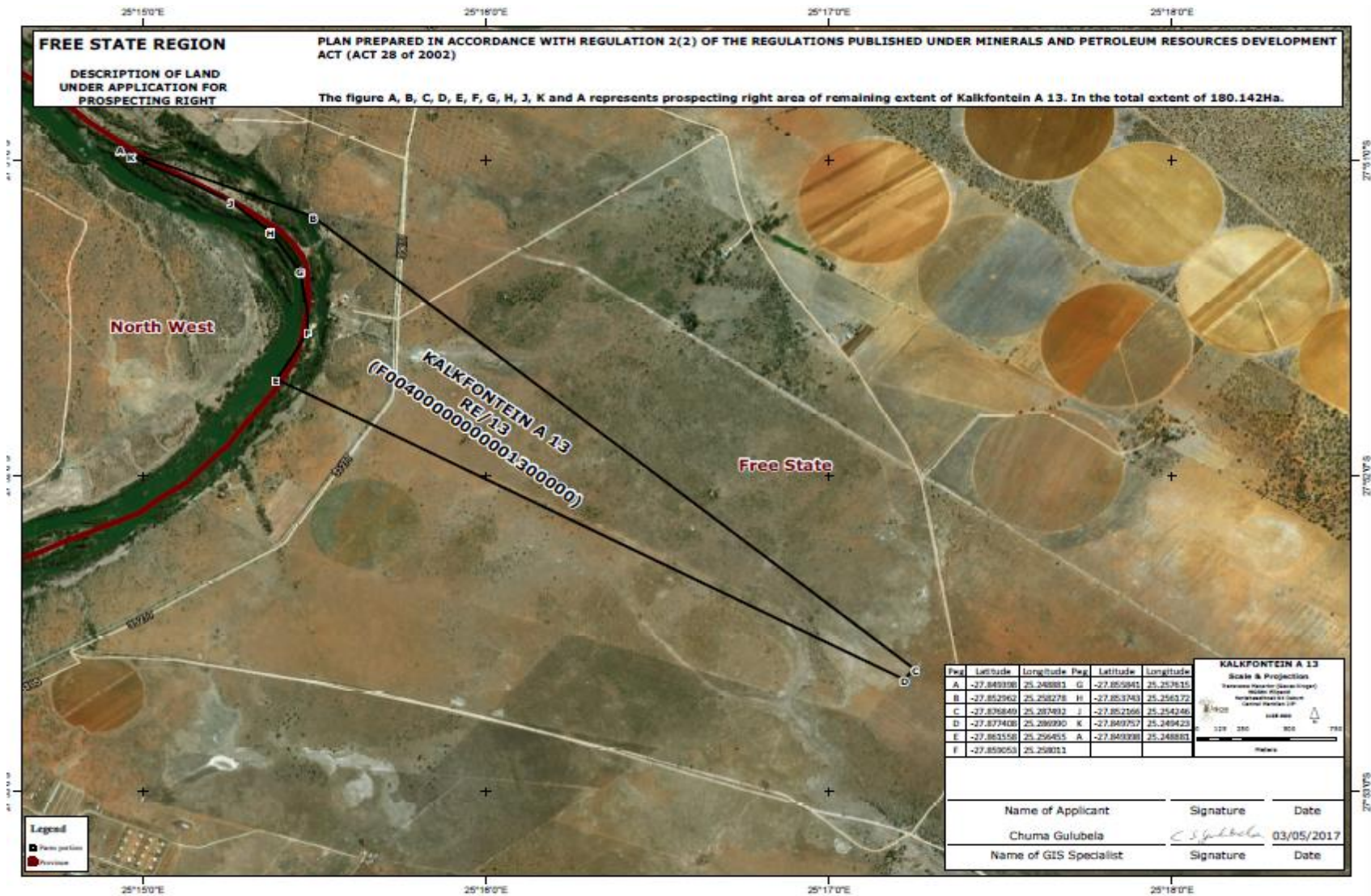


Figure 1: Location of the study area

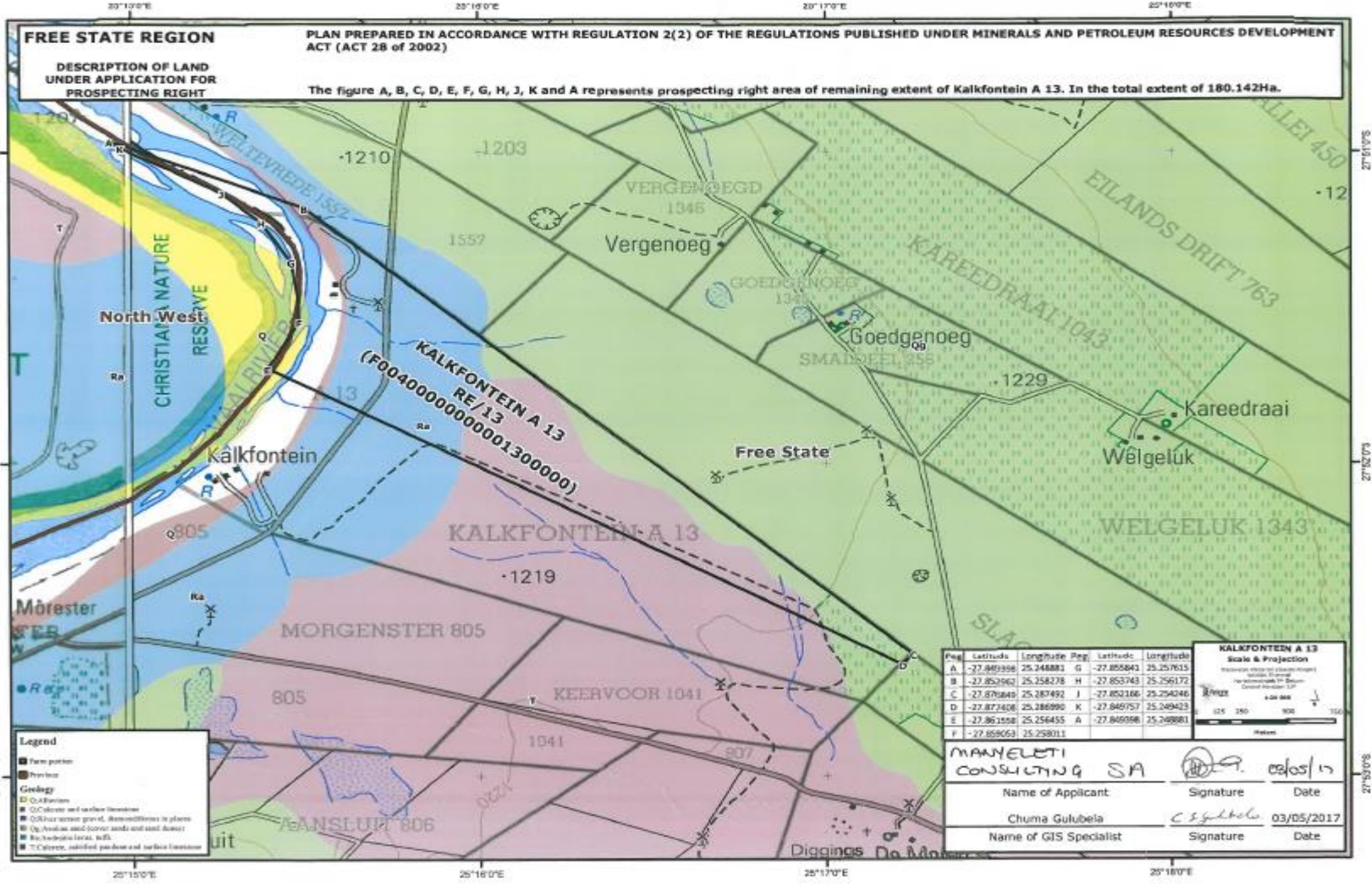


Figure 2: Location of the study area

Project description

The proposed mining project is located on Remainder of Kalkfontein A13, situated within Boshof Local Municipality of the Free State Province, South Africa. This project is situated close to N12 near Christiana. The applicant is proposing to prospect and explore for all classes of diamond; alluvial and kimberlite in the proposed area; covering an extent of 180.142Ha. The proposed area identified is located within the ambit of Boshof Local Municipality, in Free State. The proposed activity (Prospecting) programme will involve: 1. Geological reviews, field mapping 2. Drilling of boreholes using gridding of 200mx200mx10m 3. Bulk sampling extraction from 20mx10mx5m. Once the project is complete under prospecting, the applicant will embark on rehabilitating the boreholes and other areas impacted as a result of this prospecting project.

Legislation Context

Relevant pieces of legislations to the present study are presented here. Under the National Heritage Resources Act (Act 25 of 1999) (NHRA), Mineral and Petroleum Resources Development Act 28 of 2002, and the National Environmental Management Act (NEMA), an AIA or HIA is required as a specialist sub-section of the EIA.

Heritage management and conservation in South Africa is governed by the NHRA and falls under the overall jurisdiction of the SAHRA and its PHRAs. There are different sections of the NHRA that are relevant to this study. The present proposed development is a listed activity in terms of Section 38 of the NHRA which stipulates that the following development categories require a HIA to be conducted by an independent heritage management consultant:

- Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length
- Construction of bridge or similar structure exceeding 50m in length
- Development or other activity that will change the character of a site -
 - Exceeding 5000 sq. m
 - Involving three or more existing erven or subdivisions

- Involving three or more erven or divisions that have been consolidated within past five years
- Rezoning of site exceeding 10 000 sq. m
- The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority

- Any other development category, public open space, squares, parks, recreation grounds

Thus any person undertaking any development in the above categories, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. Section 38 (2) (a) of the same act also requires the submission of a heritage impact assessment report for authorization purposes to the responsible heritage resources agencies (SAHRA/PHRAs). Because, the proposed gold prospecting of will change the character of a site exceeding 5000 sq. m, then a HIA is required according to this section of act.

Related to Section 38 of the NHRA are Sections 34, 35, 36 and 37. Section 34 stipulates that no person may alter, damage, destroy, relocate etc any building or structure older than 60 years, without a permit issued by SAHRA or a provincial heritage resources authority. This section may not apply to present study since none were identified. Section 35 (4) of the NHRA stipulates that no person may, without a permit issued by SAHRA, destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object. This section may apply to any significant archaeological sites that may be discovered before or during construction. This means that any chance find must be reported to SAHRA or the relevant PHRA, who will assist in investigating the extent and significance of the finds and inform about further actions. Such actions may entail the removal of material after documenting the find site or mapping of larger sections before destruction. Section 36 (3) of the NHRA also stipulates that no person may, without a permit issued by the South African Heritage Resources Agency (SAHRA), destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority. This section may apply in case of the discovery of chance burials, which is unlikely. The procedure for reporting chance finds also applies to the unlikely discovery of burials or graves by the developer or his contractors. Section 37 of the NHRA deals with public monuments and memorials but this may not apply to this study.

In addition, the new EIA Regulations (21 April 2006) promulgated in terms of NEMA (Act 107 of 1998) determine that any environmental reports will include cultural (heritage) issues. The new regulations in terms of Chapter 5 of the NEMA provide for an assessment of development impacts on the cultural (heritage) and social environment and for Specialist Studies in this regard. The end purpose of such a report is to alert the developer, the environmental consultant, SAHRA or the relevant PHRA and interested and affected parties about existing heritage resources that may be affected by the proposed development, and to recommend mitigatory measures aimed at reducing the risks of any adverse impacts on these heritage resources.

Evaluation of the proposed development as guided by the criteria in NHRA, MPRDA and NEMA

ACT	Stipulation for developments	Requirement details
NHRA Section 38	Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
	Construction of bridge or similar structure exceeding 50m in length	No
	Development exceeding 5000 sq. m	Yes
	Development involving three or more existing erven or subdivisions	No
	Development involving three or more erven or divisions that have been consolidated within past five years	No
	Rezoning of site exceeding 10 000 sq. m	Not available
	Any other development category, public open space, squares, parks, recreation grounds	No
NHRA Section 34	Impacts on buildings and structures older than 60 years	Subject to identification during Phase 1
NHRA Section 35	Impacts on archaeological and paleontological heritage resources	Subject to identification during Phase 1
NHRA Section 36	Impacts on graves	Subject to identification during Phase 1
NHRA Section 37	Impacts on public monuments	Subject to identification during Phase 1
Chapter 5 (21/04/2006) NEMA	HIA is required as part of an EIA	Yes
Section 39(3)(b) (iii) of the MPRDA	AIA/HIA is required as part of an EIA	Yes

Methodology

The proposed prospecting Rights application requires clearance and authorisation from government compliance agencies, therefore the study aims at providing an informed heritage-related opinion about the proposed development.

Key AIA objectives for this project are to:

- Fulfil the statutory requirements of Section 38 of the NHRA.
- Identify and describe, (in terms of their conservation and / or preservation importance) sites of cultural and archaeological importance that may be affected by the proposed prospecting activities.
- Assess the significance of the resources where they are identified.
- Evaluate the impact thereon with respect to the socio-economic opportunities and benefits that would be derived from the proposed development.
- Provide guidelines for protection and management of identified heritage sites and places (including associated intangible heritage resources management that may apply).
- Consult with the affected and other interested parties, where applicable, in regard to the impact on the heritage resources in the project's receiving environment.
- Make recommendations on mitigation measures with the view to reduce specific adverse impacts and enhance specific positive impacts on the heritage resources.
- Take responsibility for communicating with the SAHRA and other authorities in order to obtain the relevant permits and authorization with reference to heritage aspects.

In order to meet the objectives of the AIA/HIA Phase 1 study, the following tasks were conducted: 1) site file search (SAHRIS), 2) literature review, 3) consultations with the affected communities, 4) completion of a field survey and assessment and 5) analysis of the acquired data and report production. The following tasks were undertaken:

- Preparation of a predictive model for archaeological heritage resources in the study area.
- A review and gap analysis of archaeological, historical, and cultural background information, including possible previous heritage consultant reports specific to the affected project area, the context of the study area and previous land use history as well as a site search;
- Field survey of sampled sections of the proposed prospecting site, in order to test the predictive model regarding that heritage sites in the area;
- Physical cultural property recording of any identified sites or cultural heritage places;

- Identification of heritage significance; and
- Preparation of AIA report with recommendation, planning constraints and opportunities associated with the proposed development.

Accordingly, published literature and cartographic data, as well as archival data on heritage legislation, the history and archaeology of the area were studied. There are very limited archaeological Cultural Resources Management (CRM) projects that were undertaken in the area under study but there are a few relevant examples with the 30km radius of the site (Pelser 2000; Dreyer 2006; 2008, Van Schalkwyk, 2017). Walking surveys were conducted in order to identify and document archaeological and cultural sites in the areas affected by the proposed mining development. Formal and informal settlements, grazing lands, vegetated river valleys; access and main road infrastructures, irrigation farms and infrastructure, bulk water pipelines, existing transmission and distribution, farmsteads and other auxiliary infrastructures dominate the affected project area. Although access to the site was denied by the farm owners, the project area was accessible through a network of main roads, district roads and farm tracks used to access the settlements. Geographic coordinates were obtained with a handheld Garmin GPS global positioning unit. Photographs were taken as part of the documentation process during field study.

Impact Assessment

The impact assessment takes into account the nature, scale and duration of the effects on the cultural landscape and whether such effects are positive (beneficial) or negative (detrimental).

A rating/point system is applied to the potential impacts on the affected environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each issue, the following criteria are used and points awarded as shown:

- Extent: National - 4; Regional – 3; Local – 2; Site – 1.
- Duration: Permanent – 4; Long term – 3; Medium term – 2; Short term – 1.
- Intensity: Very high – 4; High – 3; Moderate – 2; Low – 1.
- Probability of Occurrence: Definite – 4; Highly probable – 3; Possible – 2; Impossible – 1.

Criteria for the classification of an impact

Nature

A brief description of the cultural aspect being impacted upon by a particular action or activity is presented.

Extent (Scale)

Considering the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact.

- Site: Within the construction site
- Local: Within a radius of 2 km of the construction site
- Regional: Provincial (and parts of neighbouring provinces)
- National: The whole of South Africa

Duration

Indicates what the lifetime of the impact will be.

- Short-term: The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase.

- Medium-term: The impact will last for the period of the construction phase, where after it will be entirely negated.
- Long-term: The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter.
- Permanent: The only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

Intensity

Describes whether an impact is destructive or benign.

- Low: Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.
- Medium: Effected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way.
- High: Natural, cultural and social functions and processes are altered to extent that they temporarily cease.
- Very high: Natural, cultural and social functions and processes are altered to extent that they permanently cease.

Probability

Probability is the description of the likelihood of an impact occurring.

- Improbable: Likelihood of the impact materialising is very low.
- Possible: The impact may occur.
- Highly probable: Most likely that the impact will occur.
- Definite: Impact will certainly occur.

Significance

Significance is determined through a synthesis of impact characteristics. It is an indication of the importance of the impact in terms of both the physical extent and the time scale and therefore indicates the

level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Using the scoring from the previous section, the significance of impacts is rated as follows:

- Low impact: 4-7 points. No permanent impact of significance. Mitigating measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.
- Medium impact: 8-10 points. Mitigation is possible with additional design and construction inputs.
- High impact: 11-13 points. The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
- Very high impact: 14-16 points. The design of the site may be affected. Intensive remediation as needed during construction and/or operational phases. Any activity, which results in a “very high impact”, is likely to be a fatal flaw.

Status

Status gives an indication of the perceived effect of the impact on the area.

- Positive (+): Beneficial impact.
- Negative (-): Harmful or adverse impact.
- Neutral Impact (0): Neither beneficial nor adverse.

It is important to note that the status of an impact is assigned based on the *status quo*. That is, should the project not proceed. Therefore, not all negative impacts are equally significant. The suitability and feasibility of all proposed mitigation measures will be included in the assessment of significant impacts. This will be achieved through the comparison of the significance of the impact before and after the proposed mitigation measure is implemented.

Assumptions and Limitations

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be remembered that archaeological deposits (including graves and traces of mining heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities must be halted immediately, and a competent heritage practitioner, SAHRA or PHRA must be notified in order for an investigation and evaluation of the find(s) to take place (see NHRA (Act No. 25 of 1999), Section 36 (6)). Recommendations contained in this document do not exempt the developer from complying with any national, provincial and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA. The author assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

The field survey was limited because the farm owner refused access to the proposed development site. The field survey was limited to sections accessible through public roads. The field survey did not include any form of subsurface inspection beyond the inspection of burrows, road cut sections, and the sections exposed by erosion or field ploughing. Some assumptions were made as part of the study and therefore some limitations, uncertainties and gaps in information apply. It should however, be noted that these do not invalidate the findings of this study in any significant way:

- The proposed development will be limited to specific right of corridors as detailed in the development layout (Figure 1 & 2).
- The prospecting team will utilize existing access to the proposed development site and service sites will use the existing access roads and there will be no construction without any major deviations.
- The study observed that most sections of the project area have low potential to yield significant in situ archaeological or physical cultural properties.
- No excavations or sampling were undertaken, since a permit from heritage authorities is required to disturb a heritage resource. As such the results herein discussed are based on surface observed indicators, these surface observations concentrated on exposed sections such as road cuts and clear farmland.
- This study did not include any ethnographic and oral historical studies nor did it investigate the settlement history of the area.

Results: The archaeology of the project area

South Africa is one of the privileged countries in the world to have a very long and varied history of human occupation (Deacon and Deacon 1999). The Free State Province is one area where indications of this rich and diverse historical sequence can be crystallised. Very limited Stone Age resources were identified in most of the consulted literature, making it unlikely but equally possible to encounter Stone Age sites and occurrences within the proposed development footprint. The primary Stone Age landmarks appear to be sparsely concentrated around the Vredefort Dome where cave and rock formations (together with general factors such as water, vegetation, faunal resources) continue to attract human habitation. The same area of the Vredefort Dome also has some concentration of Later Iron Age, historical and mining heritage resources of note (Figure 1; Taylor 1979; Pelsner 2000; 2009; Naude 2009).

The well-known rock engraving site on the farm Stowlands, containing engravings dating to different periods, as well as graffiti dating to the Second South African War is located approximately 8km from the development site and 3km from Christiana (North West). From Christiana one takes the road to Hertzogville and two km after crossing the Vaal one turns to the left and follows the river up-stream for 3km. The site is on a low koppie near a farmhouse. There are a large number of engravings of good quality on the smooth rocks, showing a great variety of figures executed in both the incised line and pecking techniques. The site was proclaimed in 1936 as a National Monument (<http://www.sahra.org.za/sahris/sites/923030002>). Fock & Fock (1989) confirm that they are a number of other sites in the larger Free State region. All rock engravings, as well as rock paintings are protected by the NHRA; it is a serious offence to destroy or damage them or to remove them without the consent of SAHRA.



Figure 4: View of sign post showing direction to the Rock Engraving site (Author 2017)

1.1 Stone Age Archaeology

Stone Age archaeology is prevalent in the Free State Province but is generally thin in the area under study. The ESA is generally associated with the earliest stone tool industry (Oldowan industry) which is marked by crude choppers and other unifacial core tools, followed by the still large but better fashioned hand axes and cleavers of the Acheulean techno-complex (Deacon and Deacon 1999). The MSA is better understood as a flake-technological stage characterized by faceted platforms, produced from prepared cores, as distinct from

the core tool-based ESA technology (Barham and Mitchell 2008). More technological and behavioural changes than those witnessed in the MSA, occurred during the LSA (~ 40-25 000, to recently, 100 years ago), which is also associated with *Homo Sapiens* (Barham and Mitchell 2008). For the first time there is evidence of people's activities derived from material other than stone tools (ostrich eggshell beads, ground bone arrowheads, small bored stones and wood fragments) (Deacon and Deacon 1999). The LSA people are also credited with the production of rock art (engravings and paintings), which is an expression of their complex social and spiritual beliefs (Parkington *et al.* 2008).

To the northeast, notable MSA/LSA remains have been reported around the Vredefort Dome. Some of these materials occur in cave where they are associated with transhumance but some have been reported in open air area, especially close to the Vaal River (Pelsers 2009: 164). The finds include scrapers, blades, cores, flakes, hammerstones, and small microlithic tools that occur as scattered finds. In general, very little is known about the Stone Age archaeology of the area under study.

Iron Age Archaeology

Agriculturalist communities entered southern Africa from West and East Africa around AD 200 and brought with them settled agriculture, metal working, animal husbandry, pottery making and social stratification, all of which are purported to mark a clear contrast from the Stone Age lifeways that the farmers came in contact with (Huffman 2007). Huffman (2007) argues that ceramics can be used to trace these movements, as well as the broad linguistic identities of people but not necessarily their specific social or political groupings. After missing out on the Early Iron Age occupation, the earliest Iron Age expression in the general area under study is related to makers of Ntsuanatsatsi ceramic facies (AD 1450-1650) of the LIA. Perhaps the declining summer rainfall restricted the earlier EIA occupation to a diminishing belt close to the southeast Coast and northern parts of South Africa (Maggs 1994).

Huffman (2007) classifies Ntsuanatsatsi as Nguni, while Maggs (1976) classifies it as Sotho-Tswana but one thing is clear, this was just the formative phase of the population agglomeration is evidence during the subsequent phases of both the Nguni and Sotho-Tswana, now using stone walling to demarcate space in the nucleated settlement patterns of the already established Central Cattle Pattern (CCP). The agglomeration was later intensified by the *Mfecane* (the wars and population movements of the early 19th Century which culminated in the establishment of the Zulu Kingdom).

The stonewalled settlements of the LIA are better represented in the general area under study, even though one may not expect to encounter a secure LIA occupation on the clearly farmed development footprint. Noteworthy, is the site of Askoppies (ash heaps) located close to Vredefort Dome (Figure 1). This stone walled site with over 20 individual homesteads of between 8 and 15 scalloped areas (with hut foundation) produced impressive materials that include sea shells, pottery, ivory bangles, hippo tusks, iron spears, cuprous earrings, bone pendants, smelting furnace remains, slag, tuyeres and a glass bead (Pelser 2009: 166-170). The ivory bangles are clearly status insignia showing that the occupants of the particular homestead may have been elite, a view supported by the associated large cattle kraal and perhaps the cuprous tear-drop earrings. The latter were clearly obtained through trade, perhaps with communities further to the north because these earrings (some of which are bronzes made from Rooiberg tin) are common in the large Sotho-Tswana town found in Magaliesburg-Rusternberg area.

Other researchers who surveyed the general area concur that the area covered by the Vredefort Dome Conservancy and its surroundings are rich LIA remains in the form of stone-walls dating from the 17th century to early 19th Century (Bakker et al. 2004; Dreyer 1999; 2006).

Historical and mining heritage (~ AD 1800 to 1950)

Southern Africa was networked with the literate world for several centuries, but the period of written history in the study area corresponds to the increased arrival of travelers and white farmers in the 1800s. Before this, the Portuguese maritime expansion had begun around in the 15th Century culminating with Vasco da Gama reaching several places along South Africa's coast and trading with Khoekhoen (Khoi) and Bantu-speaking groups along the coast. From AD 1591 the Dutch and English ships joined the trade resulting in more permanent settler life, first in Cape Town before the white farmers (free burghers) pushed into the interior.

In 1820 a major British settlement was implanted on the eastern frontier of the Cape Colony, resulting in large numbers of the community moving into the interior, initially to KwaZulu-Natal, and then after Britain annexed Natal (1843), further into the interior to beyond the Vaal River. Disruptions of the *Mfecane* eased their takeover of African lands and the Boers (farmers) established several Republics. Ethnographically, recollections of major events such as the *Mfecane* stand out. These wars definitely affected the area under study, in as much as they affected much of the interior, even beyond the Zambezi. The ripple effects resulted in the disruptions of Sotho-Tswana groups in the Free State. In 1824 Mzilikazi, one of Shaka's exceptional

general fled the Zulu king with about 20000 followers and on highway north briefly established two strong holds at Mosega and Kapain, from which he controlled and scattered the many Sotho-Tswana groups such as the Kwena, who in 1823 were settled on Kokosi hill (now Losberg) north of the Vredefort Dome (Naude 2009). Cattle raiding, conflict over land and changes in climatic and subsistence strategies characterised much of the cultural landscape of the time.

The first European settler occupation of area around the development footprint happened in the 1830s (Pelser 2009: 171). This occupation was influenced by both the need for farmland, as well as prospecting and mining for gold. The activities left unmistakable landmarks such as holes and trenches, mine dumps, mine tunnels and remains of various structures for both dwellings and farm/mine activities (Figure 3).



Figure 5: A historical image of 19th century gold mining activities near Rooderand Goldfields in Venterskroon (Pelser 2009: 176).

Decorated historical porcelain and metals usually accompany these sites. Cemeteries, some of which have marked graves dating as early as 1910, also occur in the general area under study. One of the most important one is the Anglo-Boer War (AD 1899-1902) cemetery and concentration camp memorial near Koppies to the southwest of the dome (Pelser 2009: 178).

The town of Christiana (North West Province) was established on the farm Zoutpanpdrift in 1895 and became a municipality in 1904. It was named in honour of the daughter of MW Pretorius, first president of the South African Republic (ZAR) (Raper 2004:55). As it is located on the Vaal River, the railway line passing through the region played an important role during the Anglo Boer War (1899-1902). Blockhouses were erected by the British to protect the railway line and bridges across the river. The blockhouses were built Royal Engineers from masonry (Tomlinson 1997). A single blockhouse is said to exist on the farm Stowlands south of the Vaal River (Free State Province).

9.4 Intangible Heritage

As defined in terms of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003) intangible heritage includes oral traditions, knowledge and practices concerning nature, traditional

craftsmanship and rituals and festive events, as well as the instruments, objects, artefacts and cultural spaces associated with group(s) of people. Thus intangible heritage is better defined and understood by the particular group of people that uphold it. In the present study area, localised places of intangible heritage may exist but these have not yet been fully explored.

Photographic Presentation of the project site



Figure 6: A road that cuts across the proposed mining site (Author 2017).



Figure 7: General view of project site (Author 2017).



Figure 8: General view of project sit (Author 2017).



Figure 9: View of farm house taken from the road (Author 2017).



Figure 10: View of project site (Author 2017).

Summary of findings

Heritage resource	Status/Findings
Buildings, structures, places and equipment of cultural significance	None exists within the development footprint
Areas to which oral traditions are attached or which are associated with intangible heritage	The literature suggests several Sotho-Tswana speaking groups in the general area
Historical settlements and townscapes	None survives in the proposed area
Landscapes and natural features of cultural significance	None
Archaeological and paleontological sites	None identified during the study
Graves and burial grounds	Although none were recorded, it is likely that there may be a burial site within the homestead which was not accessible
Movable objects	None identified during the study
Rock Art	There is a site located approximately 8km from the proposed development site
Overall comment	No significant archaeological findings were reported in the literature, cartographic data or databases but surface and sub-surface chance finds are still possible and can only be ruled out with a full scale Phase 1 study.

- **Archaeological and Heritage Site**

The proposed prospecting site did not yield any confirmable archaeological remains. It is assumed that the chances of recovering significant archaeological materials *in situ* were seriously compromised by agriculture activities and associated infrastructure.

- **Historical Buildings and Structures**

The proposed prospecting site did not yield any buildings or structures older than 60 years. The farm house within the prospecting site is most probably younger than 60 years and will not be affected by the prospecting activities. In terms of the built environment, the area has no significance. There are no other structures, features or old equipment in the study area.

- **Burial Grounds and Graves**

Human remains and burials are commonly found close to archaeological sites and abandoned homesteads where they are often neglected. Burials also occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. The proposed prospecting site did not yield any graves or burial grounds. However, it is highly likely that they may be graves associated with the farm house located on the edge of the proposed prospecting site. It should be noted that burial grounds and gravesites are accorded the highest social significance threshold (**See Appendix 3**). They have both historical and social significance and are considered sacred. Wherever they exist or not, they may not be tempered with or interfered with during any development. The possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present. Although the possibility of encountering previously unidentified burial sites is low within the proposed prospecting site, should such sites be identified during subsurface construction work, they are still protected by applicable legislations and they should be protected (**See Appendices 2 &3 for more details**).

- **Historical Monuments and Memorials**

The proposed site did not yield any historical monuments and memorials.

- **Mitigation Measures**

No mitigation is required for the proposed prospecting rights application.

Discussion

There are very limited archaeological Cultural Resources Management (CRM) projects that were undertaken in the area under study but there are a few relevant examples with the 30km radius of the site (Pelser 2000; Dreyer 2006; 2008). These studies mention the rock art site which is located approximately 8km from the proposed prospecting area. The proposed Prospecting Rights Application area did not yield any heritage resources. The lack of confirmable archaeological sites recorded during the current survey is thought to be a result of three primary interrelated factors:

1. That proposed Prospecting Rights Application area is located within a heavily degraded area, and have reduced sensitivity for the presence of high significance physical cultural site remains, be they archaeological, historical or burial sites, due to previous earth moving disturbances resulting from developments and other land uses in the project area.
2. That the survey focused on sample sections that had high potential to yield possible archaeological sites. Due to the size of the prospecting site and limited access, it was impractical to cover every inch of the project area. As such, there is the possibility that low to medium archaeological sites exist in the project area whereas the sampled sections fell outside sections with potential distinct archaeological sites.
3. Limited ground surface visibility on sections of all the proposed Prospecting Rights Application area that were not cleared at the time of the study may have impeded the detection of other physical cultural heritage site remains or archaeological signatures immediately associated with the mine development. This factor is exacerbated by the fact that the study was limited to general survey without necessarily conducting any detailed inspection of specific locations that will be affected by the proposed mine development.

The absence of confirmable and significant archaeological cultural heritage site is not evidence in itself that such sites did not exist in the proposed mining development area. It may be that, given the dense development in most sections of the development site, if such sites existed before, changing earth-moving activities may have destroyed their evidence on the surface. Furthermore, some sections were not accessible due to thick vegetation cover. Significance of the site of Interest is not limited to presence or absence of physical archaeological sites.

Chance findings procedures

It has already been highlighted that sub-surface materials may still be lying hidden from surface surveys. Therefore, absence (during the survey) is not evidence of absence all together. The following monitoring and reporting procedures must be followed in the event of a chance find, in order to ensure compliance with heritage laws and policies for best-practice. This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. Accordingly, all excavation crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds.

- If during prospecting, mining or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- The site manager must then make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area before informing SAHRA/PHRA.

Recommendations

The following recommendations are based on the results of the AIA research, cultural heritage background review, site inspection and assessment of significance.

Recommendation 1

Based on the findings of this study, the proposed prospecting rights application is viable, the study did not find any archaeological and heritage remains to warrant abandonment of the project

Recommendation 2

The Project Public Participation Process (PPP) should ensure that any cultural heritage related matters for this project are given due attention whenever they arise and are communicated to PHRA throughout the proposed project development. This form of extended community involvement would pre-empt any potential disruptions that may arise from previously unknown cultural heritage matter that may have escaped the attention of this study.

Recommendation 3

Location of prospecting points and equipment should be restricted to minimum footprint impact especially where such infrastructure falls within bushy area. Such bushy sections have local ethnobotany significance as sources of traditional herbs and medicines. As such disruption and vegetation clearance should be minimal. Preserved bushveld areas should be protected for ethnobotany significance. As such this development, should avoid excessive vegetation clearance during the development.

Recommendation 4

The foot print impact of the mine development should be kept to minimal to limit the possibility of encountering chance finds within servitude.

Recommendation 5

In situations where unpredicted impacts occur (such as accidentally disturbing a previously unknown grave), construction activities should be stopped and the heritage authority notified immediately. In the unlikely event of chance archaeological material or previously unknown human remains being disturbed during subsurface construction, the finds should be left *in situ* subject to further instruction from the project archaeologist or heritage authorities (refer to Appendixes 1 - 4 for additional details). The overriding objective, where remedial action is warranted, is to minimize disruption in construction scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA and NHRA regulations.

Concluding Remarks

For compliance with South African heritage legislation and other environmental laws, Ankone Consulting (Pty) Ltd requested ISS to conduct an AIA/HIA study for the proposed prospecting rights application on a portion of the farm Kalkfontein A 13, within Boshof Local Municipality of the Free State Province. The proposed mining development site does not lie on pristine ground, having been partially disturbed by agriculture. Desktop research suggested that the general area is archaeologically rich but no known sites were identified on the proposed prospecting site. In terms of the archaeology and heritage with respect to the proposed prospecting rights application, there are no obvious 'Fatal Flaws' or 'No-Go' areas. However, the potential for chance finds, still remains and the developer and contractors are advised to be diligent and observant, should prospecting be allowed to commence. The procedure for reporting chance finds has clearly been laid out. This report concludes that the proposed prospecting rights application may be approved by SAHRA to proceed as planned subject to recommendations herein made

References

- Bakker, K., Naude, M., Clarke, N., Van Schalkwyk, J., Van Vuuren, C. and Van Zyl, C. 2004. Vredefort Dome Cultural Heritage Survey and Conservation Management Plan. Pretoria: SAHRA.
- Barham, L. and Mitchell, P. 2008. *The first Africans: African archaeology from the earliest toolmakers to most recent foragers*. Cambridge: Cambridge university press.
- Deacon, H.J. and Deacon, J. 1999. *Human beginnings in South Africa: Uncovering the secrets of the Stone Age*. Cape Town: David Philip.
- Dreyer, J. 1999. Batlokoa History: Report on an archaeological survey of stone-walled sites in the north-eastern Free State. Grahamstown: Albany Museum. *Southern African Field Archaeology* 8(1):46-56.
- EThembeni Cultural Heritage 2006. Heritage Impact Assessment of N12 Borrow Pits, Bloemhof to Christiana North West Province, South Africa
- Fock, G.J. & Fock, D. 1984. *Feldsbilder in Sudafrika. Teil II. Kinderdam und Kalahari*. Koln: Bohlau Verlag.
- Huffman, T.N. 2007. *Handbook to the Iron Age: The archaeology of pre-colonial farming societies in southern Africa*. Scottville: University of KwaZulu Natal Press.
- Hutten, M. 2011. Heritage Impact Assessment for the proposed Tikwana Solar Park near Hoopstad, Free State Province, 22 pp. Hutten Heritage Consultants, Louis Trichard.
- King, T. F. 1989. *The archaeological survey: methods and uses*. Quoted in Canter, L. W. 1996. *Environmental impact assessment*. Second Edition. New York: McGraw-Hill, Inc.
- Maggs, T.M. 1976. *Iron Age Communities of the Southern Highveld*. Pietermaritzburg: Natal Museum.
- Mitchell, P. 2002. *The archaeology of southern Africa*. Cambridge: Cambridge University Press.
- National Environmental Management Act 107 of 1998*
- National Heritage Resources Act NHRA of 1999 (Act 25 of 1999)*

Naude, M. 2009. Beyond the frontier history of the Vredefort Dome Area. In: Reimold, U. & Gibson, R. (eds) *Meteorite Impact! The Danger from Space and South Africa's Mega-Impact. The Vredefort Structure*. Johannesburg: Chris van Rensburg Publications: 179-196

Parkington, J, Morris, D, and Rusch, N. 2008. *Karoo Rock Engravings: Follow the San*. Cape Town: Credo Communications.

Pelser, A. 2009. Travelling through Time: Archaeology and the Vredefort Dome. In: Reimold, U. & Gibson, R. (eds) *Meteorite Impact! The Danger from Space and South Africa's Mega-Impact, the Vredefort Structure*: 164-178. Johannesburg: Springer

Pelser, A. 2000. A report on the first phase of a cultural resource survey on the Vredefort Dome. Pretoria: National Cultural History Museum, Archaeology Department.

Taylor, M.O.V. 1979. *Late Iron Age Settlements on the Northern Edge of the Vredefort Dome*. M.A. Johannesburg: University of the Witwatersrand

J A van Schalkwyk, 2017. Phase 1 Cultural Heritage Impact Assessment: mining permit application for the removal of diamonds alluvial and diamond general on a certain portion on the remaining extent of Portion 1 of the farm Christiana Town & Townlands 325HO, Lekwa Teemane Local Municipality, North West Province

APPENDIX 1: HERITAGE MANAGEMENT PLAN INPUT INTO THE PROPOSED MINING PROJECT

Objective								
<ul style="list-style-type: none"> Protection of archaeological sites and land considered to be of cultural value; Protection of known physical cultural property sites against vandalism, destruction and theft; and The preservation and appropriate management of new archaeological finds should these be discovered during construction. 								
No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Planning	Ensure all known sites of cultural, archaeological, and historical significance are demarcated on the site layout plan, and marked as no-go areas.	Throughout Project	Weekly Inspection	Contractor [C] CECO	SM	ECO	EA EM PM
Construction Phase								
1	Emergency Response	Should any archaeological or physical cultural property heritage resources be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped until heritage authority has cleared the development to continue.	N/A	Throughout	C CECO	SM	ECO	EA EM PM
		Should any archaeological, cultural property heritage resources be exposed during excavation or be found on development site, a registered heritage specialist or PHRA official must be called to site for inspection.		Throughout	C CECO	SM	ECO	EA EM PM
		Under no circumstances may any archaeological, historical or any physical cultural property heritage material be destroyed or removed from site;		Throughout	C CECO	SM	ECO	EA EM PM
		Should remains and/or artefacts be discovered on the development site during earthworks, all work will cease in the area affected and the Contractor will immediately inform the Construction Manager who in turn will inform PHRA.		When necessary	C CECO	SM	ECO	EA EM PM
		Should any remains be found on site that is potentially human remains, the PHRA and South African Police Service should be contacted.		When necessary	C CECO	SM	ECO	EA EM PM
Rehabilitation Phase								
		Same as construction phase.						
Operational Phase								
		Same as construction phase.						

Appendix 2: heritage mitigation measure table

SITE REF	HERITAGE ASPECT	POTENTIAL IMPACT	MITIGATION MEASURES	RESPONSIBLE PARTY	PENALTY	METHOD REQUIRED	STATEMENT
Chance Archaeological and Burial Sites	General area where the proposed project is situated is a historic landscape, which may yield archaeological, cultural property, remains. There are possibilities of encountering unknown archaeological sites during subsurface construction work which may disturb previously unidentified chance finds.	<p>Possible damage to previously unidentified archaeological and burial sites during construction phase.</p> <ul style="list-style-type: none"> • Unanticipated impacts on archaeological sites where project actions inadvertently uncovered significant archaeological sites. • Loss of historic cultural landscape; • Destruction of burial sites and associated graves • Loss of aesthetic value due to construction work • Loss of sense of place <p>Loss of intangible heritage value due to change in land use</p>	<p>In situations where unpredicted impacts occur construction activities must be stopped and the heritage authority should be notified immediately.</p> <p>Where remedial action is warranted, minimize disruption in construction scheduling while recovering archaeological data. Where necessary, implement emergency measures to mitigate.</p> <ul style="list-style-type: none"> • Where burial sites are accidentally disturbed during construction, the affected area should be demarcated as no-go zone by use of fencing during construction, and access thereto by the construction team must be denied. • Accidentally discovered burials in development context should be salvaged and rescued to safe sites as may be directed by relevant heritage authority. The heritage officer responsible should secure relevant heritage and health authorities permits for possible relocation of affected graves accidentally encountered during construction work. 	<ul style="list-style-type: none"> • Contractor / • Project Manager • Archaeologist • Project EO 	Fine and or imprisonment under the PHRA-FS Act & NHRA	<p>Monitoring measures should be issued as instruction within the project EMP.</p> <p>PM/ECO/Archaeologists Monitor construction work on sites where such development projects commences within the farm.</p>	

16 APPENDIX 3: LEGAL PRINCIPLES OF HERITAGE RESOURCES MANAGEMENT IN SOUTH AFRICA

Extracts relevant to this report from the National Heritage Resources Act No. 25 of 1999, (Sections 5, 36 and 47):

General principles for heritage resources management

5. (1) All authorities, bodies and persons performing functions and exercising powers in terms of this Act for the management of heritage resources must recognise the following principles:

(a) Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and as they are valuable, finite, non-renewable and irreplaceable they must be carefully managed to ensure their survival;

(b) every generation has a moral responsibility to act as trustee of the national heritage for succeeding generations and the State has an obligation to manage heritage resources in the interests of all South Africans;

(c) heritage resources have the capacity to promote reconciliation, understanding and respect, and contribute to the development of a unifying South African identity; and

(d) heritage resources management must guard against the use of heritage for sectarian purposes or political gain.

(2) To ensure that heritage resources are effectively managed—

(a) the skills and capacities of persons and communities involved in heritage resources management must be developed; and

(b) provision must be made for the ongoing education and training of existing and new heritage resources management workers.

(3) Laws, procedures and administrative practices must—

(a) be clear and generally available to those affected thereby;

(b) in addition to serving as regulatory measures, also provide guidance and information to those affected thereby; and

(c) give further content to the fundamental rights set out in the Constitution.

(4) Heritage resources form an important part of the history and beliefs of communities and must be managed in a way that acknowledges the right of affected communities to be consulted and to participate in their management.

(5) Heritage resources contribute significantly to research, education and tourism and they must be

developed and presented for these purposes in a way that ensures dignity and respect for cultural values.

(6) Policy, administrative practice and legislation must promote the integration of heritage resources conservation in urban and rural planning and social and economic development.

(7) The identification, assessment and management of the heritage resources of South Africa must—

(a) take account of all relevant cultural values and indigenous knowledge systems;

(b) take account of material or cultural heritage value and involve the least possible alteration or loss of it;

(c) promote the use and enjoyment of and access to heritage resources, in a way consistent with their cultural significance and conservation needs;

(d) contribute to social and economic development;

(e) safeguard the options of present and future generations; and

(f) be fully researched, documented and recorded.

Burial grounds and graves

36. (1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

(5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under

subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—

(a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and

(b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

(6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

(a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and

(b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

(7) (a) SAHRA must, over a period of five years from the commencement of this Act, submit to the Minister for his or her approval lists of graves and burial grounds of persons connected with the liberation struggle and who died in exile or as a result of the action of State security forces or agents provocateur and which, after a process of public consultation, it believes should be included among those protected under this section.

(b) The Minister must publish such lists as he or she approves in the Gazette.

(8) Subject to section 56(2), SAHRA has the power, with respect to the graves of victims of conflict outside the Republic, to perform any function of a provincial heritage resources authority in terms of this section.

(9) SAHRA must assist other State Departments in identifying graves in a foreign country of victims of conflict connected with the liberation struggle and, following negotiations with the next of kin, or relevant authorities, it may re-inter the remains of that person in a prominent place in the capital of the Republic.

General policy

47. (1) SAHRA and a provincial heritage resources authority—

(a) must, within three years after the commencement of this Act, adopt statements of general policy for the management of all heritage resources owned or controlled by it or vested in it; and

(b) may from time to time amend such statements so that they are adapted to changing circumstances or in accordance with increased knowledge; and

(c) must review any such statement within 10 years after its adoption.

(2) Each heritage resources authority must adopt for any place which is protected in terms of this Act and is owned or controlled by it or vested in it, a plan for the management of such place in accordance with the best environmental, heritage conservation, scientific and educational principles that can reasonably be applied taking into account the location, size and nature of the place and the resources of the authority concerned, and may from time to time review any such plan.

(3) A conservation management plan may at the discretion of the heritage resources authority concerned and for a period not exceeding 10 years, be operated either solely by the heritage resources authority or in conjunction with an environmental or tourism authority or under contractual arrangements, on such terms and conditions as the heritage resources authority may determine.

(4) Regulations by the heritage resources authority concerned must provide for a process whereby, prior to the adoption or amendment of any statement of general policy or any conservation management plan, the public and interested organisations are notified of the availability of a draft statement or plan for inspection, and comment is invited and considered by the heritage resources authority concerned.

(5) A heritage resources authority may not act in any manner inconsistent with any statement of general policy or conservation management plan.

(6) All current statements of general policy and conservation management plans adopted by a heritage resources authority must be available for public inspection on request.